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ALTERING THE TIMING OF ACADEMIC PROMPTS TO TREAT DESTRUCTIVE BEHAVIOR MAINTAINED BY ESCAPE

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Following a functional analysis showing that destructive behavior was reinforced by escape, we altered the aversiveness of task demands by interspersing easy and difficult tasks and by presenting a corrective prompt as an antecedent event the next time a previously failed item was presented; this procedure was compared with one in which the corrective prompt was provided as an immediate consequence. Results of a reversal design showed that the antecedent prompt acted as an establishing operation and reduced destructive behavior to zero.

DESCRIPTORS: academic instruction, antecedent intervention, destructive behavior, escape, establishing operation, feedback, functional analysis

One approach to the treatment of destructive behavior reinforced by escape from demands is to manipulate establishing operations (EOs), antecedent variables that alter the effectiveness of escape as reinforcement (Iwata, Smith, & Michael, 2000). Prior research has shown that (a) a variety of task properties (e.g., task difficulty, rate of demands) can establish escape as reinforcement for destructive behavior (e.g., Horner, Day, Sprague, O'Brien, & Heathfield, 1991; Smith, Iwata, Goh, & Shore, 1995) and (b) interspersing tasks with less aversive properties (Horner et al., 1991), allowing a choice among tasks (Romaniuk et al., 2002), or gradually fading in aversive tasks (Pace, Ivancic, & Jefferson, 1994) can reduce destructive behavior maintained by escape.

In the current case study, anecdotal observations during a functional analysis suggested that demands were aversive primarily when the participant received immediate corrective feedback following an error because destructive behavior often occurred when the second (modeled) prompt was delivered in the demand condition, and because similar reactions occurred in the play condition (e.g., when the participant put a puzzle piece in the wrong place and the therapist offered immediate assistance). Therefore, we subsequently developed and evaluated the effects of a teaching strategy in which easy tasks were interspersed with difficult ones and corrective feedback was delayed and made less salient by providing it as an antecedent prompt the next time a failed item was presented. We compared this antecedent intervention to the more common approach of providing corrective feedback as a consequence immediately after an error occurred.

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METHOD AND RESULTS

Participant and Setting

Jim, a 19-year-old man with mental retardation and pervasive developmental disorder secondary to traumatic brain injury, had been admitted to a day-treatment program for treatment of destructive behavior. All sessions lasted 10 min and were conducted in a room (3 m by 3 m) with padded walls, a table and a chair, and a one-way mirror for unobtrusive observation.

Response Definitions and Measurement

Jim's destructive behavior consisted of self-injurious behavior (SIB; head hitting, face scratching, hitting teeth with hand, knee biting), aggression (grabbing, pushing), and property destruction (banging or throwing objects). Observers collected frequency-within-interval data on laptop computers from behind the one-way mirror. These data were converted to a rate (responses per minute) by dividing the frequency by 10, the number of minutes in each session. Two observers simultaneously but independently recorded responses during 43.3% of the functional analysis sessions and during 41.2% of the treatment evaluation sessions. Exact agreement coefficients were calculated by first partitioning each session into 60 10-s intervals and then dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100%. An agreement was scored if both observers recorded the same number of responses in an interval. Agreement coefficients averaged 99.1% and 99.3% for SIB, 99.4% and 100% for aggression, and 97.9% and 99.3% for property destruction during functional analysis and treatment evaluation sessions, respectively.

Functional Analysis

Procedure. Functional analysis procedures were similar to those of Iwata, Slifer, Dorsey, Bauman, and Richman (1982/1994) except that (a) a tangible condition was included in which access to a puzzle was presented for 30 s contingent on destructive behavior, and (b) a pairwise comparison between the play condition and a demand condition (with difficult tasks, which are described below) was conducted to clarify whether an escape function maintained destructive behavior.

Results. Results of the functional analysis are depicted in the top panel of Figure 1. Rates of destructive behavior were higher and somewhat more consistent in demand (M = 1.5) relative to the other conditions (Ms = 0.5, 0, 1.3, and 0.8 for attention, alone, tangible, and play, respectively). In addition, when the demand and play conditions were conducted in a pairwise manner in the second phase of the functional analysis, the suspected escape function was confirmed (Ms = 1.4 and 0.3 in demand and play, respectively). We observed in these sessions that difficult demands tended to lead to errors, which resulted in corrective feedback, which in turn, evoked destructive behavior. Based on these observations, we compared two antecedent interventions for destructive behavior, one that altered task difficulty (by interspersing easy tasks among the difficult tasks) and a second that altered task difficulty in the same manner but also eliminated corrective feedback by providing an academic prompt as an antecedent the next time a previously failed item was presented.

Treatment Evaluation

Procedure. The treatment analysis consisted of a comparison (using a reversal design) between two demand conditions that were identical except for the manner in which academic prompts were delivered. During each condition, prompts to complete nonpreferred tasks (matching colors with printed names of the colors in a four-option match-

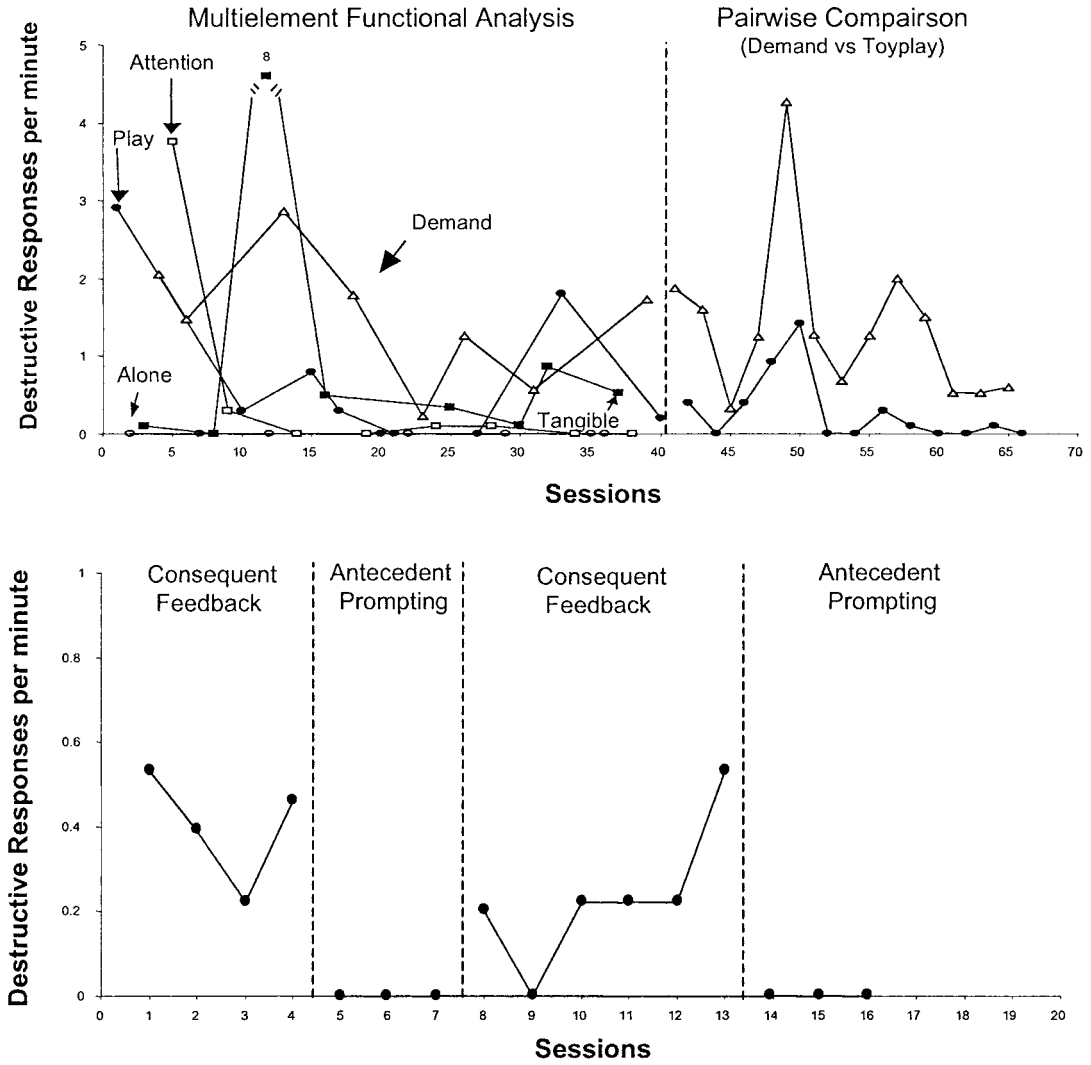

Figure 1. The top panel shows the rates of destructive behavior during the functional analysis, and the bottom panel shows the rates of destructive behavior during the treatment evaluation that compared antecedent prompting with consequent feedback.

ing-to-sample arrangement) were presented about once every 30 s, and destructive behavior resulted in a break from the tasks for 30 s. During odd-numbered trials, easy colors were presented (ones he had previously matched accurately). During even-numbered trials, more difficult colors were presented (novel items or ones he had frequently matched incorrectly in the past). Easy tasks were interspersed with difficult tasks to reduce task difficulty across each session and also so that praise was delivered on at least half of the trials in both conditions.

In the consequent feedback condition, each trial began with a verbal prompt (e.g., "Match the color with the word."). Praise followed correct responses, and corrective feedback followed incorrect responses (which occurred almost exclusively with difficult colors). Corrective feedback consisted of a vocal statement ("No, that's not right. Match the color teal with the word teal, like

this.") combined with the therapist modeling the correct response. This condition differed from the demand condition of the functional analysis in that a physical prompt was not included, and the difficulty of the task was alternated on successive trials as described above. These two changes were included in the consequent feedback condition so that this condition was equivalent to the antecedent prompting condition, except for the manner in which academic instruction was provided.

In the antecedent prompting condition, each trial began with a verbal prompt (e.g., "Match the color with the word."). Praise followed correct responses, but incorrect responses were not followed immediately by corrective feedback. Rather, the next scheduled trial was presented (which was almost always an easy item). Following this, the last task that was failed was repeated, but was preceded by the corrective prompt. The prompt consisted of a vocal statement (e.g., "This is the color teal and this is the word teal. These two go together.") combined with the therapist modeling the correct response.

Results. Results of the treatment evaluation are depicted in the bottom panel of Figure 1. Destructive behavior occurred at low but relatively consistent rates in the consequent feedback condition ($M = 0.3$), whereas destructive behavior never occurred during the antecedent prompting condition ($M = 0$). In both conditions, Jim responded correctly and received praise during almost all of the odd-numbered trials when easy items were presented (*M*s = 94% and 97% for easy colors in consequent feedback and antecedent prompting, respectively). By contrast, Jim responded correctly to a lower percentage of the difficult colors presented during even-numbered trials, but correct responding increased somewhat across successive phases (*M*s = 45%, 55%, 68%, and 77% in Phases 1 through 4, respectively).

DISCUSSION

Functional analysis results showed that Jim's destructive behavior was maintained by negative reinforcement. Anecdotal observations during the functional analysis suggested that difficult demands evoked destructive behavior primarily when Jim received immediate corrective feedback. Therefore, a treatment was developed, called antecedent prompting, to reduce the EO for destructive behavior by (a) decreasing task difficulty (by interspersing easy tasks) and (b) eliminating corrective feedback as an immediate consequence and instead delivering it as an antecedent to previously failed tasks while making no mention of the prior error. This intervention immediately reduced destructive behavior to zero even though the escape contingency remained intact. By contrast, destructive behavior occurred at higher rates when easy and difficult tasks were interspersed and correction immediately followed errors in the consequent feedback condition.

The current study adds to the literature on the effects of EOs on destructive behavior reinforced by escape (e.g., Horner et al., 1991; Smith et al., 1995) by showing that altering the timing of remedial procedures may reduce the influence of an escape contingency in some cases. It should be noted, however, that the rates of destructive behavior were considerably lower in both treatment conditions than in the demand condition of the functional analysis, which was probably due to the interspersing of easier tasks during the two treatment conditions.

One limitation of the current investigation is the fact that it involved only 1 participant. A second limitation is that it is not possible to determine whether altering the time of the corrective prompts decreased the aversiveness of the demands by eliminating

corrective feedback (i.e., no longer calling attention to the participant's errors) or by simply making the task easier. That is, in the antecedent prompting condition, the therapist modeled the correct answer just prior to the next presentation of a previously failed task. Future research should be directed at replicating these findings with additional participants and conducting analyses to determine more precisely how the EO for escape-maintained behavior was altered in the antecedent prompting condition.

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